

What is Claimed:

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[0033] 1. A processor for cleaning, rinsing, and drying workpiece comprising:
a process vessel adapted to hold one or more workpieces therein;
a vapor processing system for supplying a vapor into the process vessel, for
processing the workpieces;
a liquid supply system for introducing a liquid into the process vessel to rinse the
workpieces by immersing the workpieces in the liquid; and
10 a drying system supplying a drying fluid into the process vessel, for drying the
workpieces.

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[0034] 2. The processor according to claim 1 further including an ozone supply system
connecting to the process vessel.

[0035] 3. The processor according to claim 1 further including an overflow weir at one
side of the process vessel.

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[0036] 4. The processor according to claim 2, wherein the ozone supply system
comprises one or more spray nozzles within the process vessel.

[0037] 5. The processor according to claim 2, wherein the ozone supply system comprises a gas bubbler located near the bottom.

5 [0038] 6. The processor according to claim 1, wherein the drying system includes a gas diffuser at the top of the process vessel.

10 [0039] 7. The processor according to claim 1, further comprising one or more heaters in or on the process vessel for heating liquid in the process vessel.

15 [0040] 8. The processor according to claim 1, further including a rack in the process vessel for holding the one or more workpieces stationary within the process vessel during the cleaning, rinsing, and drying steps.

20 [0041] 9. The processor according to claim 1, further comprising a motor associated with the process vessel for spinning the one or more workpieces.

[0042] 10. The processor according to claim 1, wherein the drying system comprises one or more injectors inside the process vessel.

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5 [0043] 11. A processor for cleaning, rinsing, and drying workpieces comprising:
a process vessel adapted to hold one or more workpieces therein;
an ozone injection system coupled to the process vessel for introducing ozone gas into
the process vessel by bubbling the ozone gas up through a liquid in the process vessel;
a liquid injection system coupled to the process vessel for introducing a processing
fluid into the process vessel; and
a drying system coupled to the process vessel for supplying a drying gas into the
process vessel.

10 [0044] 12. The processor according to claim 11, wherein the drying system comprises a
gas diffuser at the top of the process vessel.

15 [0045] 13. The processor according to claim 11, further comprising one or more heaters
on the process vessel.

[0046] 14. The processor according to claim 11, further comprising a spinning
mechanism for spinning the one or more workpieces within the process vessel.

20 [0047] 15. The processor according to claim 11, further comprising a rack in the process
vessel for holding the one or more workpieces.

[0048] 16. The processor according to claim 11, wherein the drying system comprises one or more gas spray nozzles inside the process vessel.

5 [0049] 17. A method for cleaning, rinsing, and drying one or more workpieces within a single process vessel, comprising the steps of:

placing the workpieces into the process vessel;

introducing a processing fluid into the process vessel, with the processing fluid beneath the workpiece;

10 introducing ozone gas into the process vessel;

immersing the workpieces in the processing fluid within the process vessel;

introducing a drying fluid into the process vessel; and

removing the processing fluid from the process vessel.

15 [0050] 18. The method of claim 17, further comprising the step of heating the processing fluid before introducing the ozone gas into the process vessel.

[0051] 19. The method of claim 17, wherein the step of introducing the ozone gas comprises by bubbling ozone into the process fluid.

[0052] 20. The method of claim 17, further comprising the step of continuously introducing processing fluid into the process vessel during the immersing.

[0053] 21. The method of claim 17, wherein the step of introducing a drying gas comprises the step of introducing a dilute organic vapor above the processing fluid in the process vessel.

[0054] 22. The method of claim 21, wherein the dilute organic vapor comprises isopropyl alcohol.

[0055] 23. The method of claim 17, wherein the drying fluid is a drying gas selected from the group consisting of air and nitrogen.